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(54) **Stackable crate**

Stapelbarer Kasten

Casier empilable

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**Description**

The present invention concerns a stackable crate made of plastic, containing an almost rectangular bottom, two longitudinal sides, two cross sides and a lattice work which divides the crate in compartments for bottles, whereby this crate is provided with reinforcement constructions standing on the bottom and reaching almost to the top and with at least one window in at least two sides, whereby these sides are free of reinforcement constructions at the height of at least one connection with the lattice work so that a window runs uninterruptedly over two compartments in these sides.

Such crates are so-called display crates whereby the bottles contained therein are visible through windows. The problem with such crates is to combine the visibility of the bottles with the stackability. Naturally, a window in a side wall reduces the strength in the upward direction and thus the stackability. That is why the impairment by a window is compensated by confining this window by means of reinforcement constructions, usually columns, standing on the bottom and extending to or almost to the top. Wherever there is a column in a side wall, there can be no window, which reduces the visibility of the bottles, whereas no or few columns allow for large windows which reduce the strength in the upward direction, however, and make stacking impossible.

A crate of the above-mentioned type for twelve bottles is known from patent BE-A-898716. A window is provided in the cross sides which extends over three compartments, but there are no reinforcement constructions on the partition between these compartments, whereas two windows are provided in the longitudinal sides which each extend over two compartments, and whereby a reinforcement column is provided between these windows. Stacking in columns of such crates is only possible to a limited extend, and crosswise stacking is even impossible.

The invention aims to remedy these disadvantages and to provide a crate which may not only have a large window surface in the sides, thus offering a good visibility of the bottles, but which is very strong in the upward direction with a minimum of synthetic material, such that the crate can be stacked in columns as well as crosswise.

To this aim the crate is provided with a reinforcement construction in each of the four corners, and it also has reinforcement constructions on the inside standing on the bottom where four neighbouring compartments converge and reaching almost to the top.

The reinforcement constructions on the inside are situated in between the bottles and make good use of space which would otherwise be lost, without hindering the introduction of bottles in the compartments.

Preferably, the reinforcement constructions on the inside contain columns.

Also the reinforcement constructions in the four corners practically contain columns.

In a special embodiment of the crate according to the invention, the cross sides between the reinforcement

constructions in the corners are entirely free of reinforcement constructions, but the crate contains reinforcement constructions on the inside of the compartments situated along these sides.

If the crate hereby contains three compartments along these cross sides, it will have a reinforcement construction in the two inner corners of the middlemost of these compartments.

In a peculiar embodiment of the crate according to the invention, it contains two reinforcement constructions in the longitudinal sides, in between the reinforcement constructions in the corners, namely one at a distance of each cross side equal to the width of this cross side.

Moreover, the crate is preferably free of reinforcement constructions in between these two reinforcement constructions in the longitudinal sides.

If the crate contains four compartments along the longitudinal sides, a reinforcement construction will be present in these sides in the corners, and on the side of the compartments situated in the corners which is removed from the corners, whereas the longitudinal sides in between the two middlemost compartments are free of reinforcement constructions.

Other characteristics and advantages of the invention will become clear from the following description of a stackable crate according to the invention. This description is given by way of example only and without being limitative in any way. The figures refer to the accompanying drawings where:

30 figure 1 shows a top view of a stackable crate according to the invention;

35 figure 2 shows a cross view according to line II-II in figure 1;

figure 3 shows a cross view according to line III-III in figure 1;

40 figure 4 shows a cross view according to line IV-IV in figure 3;

45 figure 5 shows a cross view according to line V-V in figure 1;

figure 6 shows a bottom view of the crate from the previous figures.

The stackable crate made of plastic according to the figures contains a bottom 1 formed by a grid in the shape of a rectangle with rounded angles, two longitudinal standing sides 2, two cross standing sides 3 and a lattice work 4 standing on the bottom 1 and which divides the crate in twelve compartments 5.

Along the longitudinal sides 2 four compartments are formed and thus along the cross sides 3 three compartments are formed. The length of a longitudinal side 2 equals 4/3 of the width of a cross side 3.

On the underside of the bottom 1, edges 6 are provided such that they fit in the open top side of an identical crate which may be placed underneath, both in the case of column stacking and cross stacking, which implies that the longitudinal sides of the crates are at right angles to one another.

The crate is provided with reinforcement constructions in the four corners formed by hollow corner columns 7 extending from the bottom 1 to almost the top of the crate.

Each of the cross sides 3 is provided with a large window 8 extending from one corner column 7 to the other in the side.

At the bottom, the window is confined by a lower, strip-shaped wall part 9 which further becomes the outer side underneath the corner columns 7 and which is situated somewhat more towards the outside than the outer side of the corner columns 7 rising above it and which confine the window 8 sidelong. In between these corner columns 7, the wall part 9 is provided at the top with a reinforced edge 10 folded towards the inside. Below, at the height of the bottom 1, the wall part 9 is provided with a ribbed bumper 11 protruding towards the outside which runs on over the lower side of the corner columns 7 and thus stretches over the entire width of the side 3.

On top, the window 8 is confined by a wall part 12 which, in between the corner columns 7, is situated somewhat more to the inside and is provided with ribs 13 on the outside of which the ends are folded downwards in the shape of a bow. On top, this wall part has a thick bumper 14 pointing towards the outside which also partly runs on over the top of the corner columns 7 and thus stretches over the entire width of the side 3. The wall part 12 with the ribs 13 and the edge 14 form a grip with which the crate can be taken up.

In each of the longitudinal standing sides 2, three windows 15, 16 and 17 are provided which are separated from one another by two columns 18 which extend from the bottom 1 to the top of the sides. The middlemost window 16 is confined on both sides of the columns 18, whereas the outmost windows 15 and 17 extend from a column 18 to the nearest corner column 7.

These three windows 15, 16 and 17 are confined together at the bottom by a strip-shaped wall part 19 which is connected to a bottommost part of the corner columns 7 protruding towards the outside, and thus is situated somewhat more to the outside itself in comparison with the outer side of the corner columns 7 in the side 2 situated above said wall part. At the top, this wall part 9 in between the two columns 18 and in between each of these columns 18 and the corner columns 7 is provided with a reinforced edge 20 protruding towards the inside. At the bottom, this wall part 9 is provided with a ribbed bumper 21 protruding towards the outside which runs on over the lower side of the corner columns at the height of the bottom 1, and thus extends over the entire length of the side 2.

At the top, the three windows 15, 16 and 17 in each side 2 are confined by a strip-shaped wall part 22 which

is situated in the face of the outer side of the topmost part of the corner columns 7 and further even becomes this outer side. In between the corner columns 7, this wall part 22 is provided at the bottom with a reinforced edge 23 as shown in figure 3. At the top, a thick bumper 24 pointing towards the outside is provided on this wall part 22, which, just as the bumper 14, also runs on over the top end of the corner columns 7 and is connected with the bumpers 14 in the sides 3.

10 The two columns 18 along each longitudinal side 2 are situated on the parts of the lattice work 4 which confine a compartment 5 in a corner. Thus, these columns 18 are situated at a distance from the cross sides 3 which corresponds to the width of a side 3. Not a single column 15 or any other vertical reinforcement construction is provided in the side 3 between the two columns 18.

15 The middlemost window 16 runs uninterruptedly over two compartments 5. Thus, this window 16 offers a maximum visibility of the bottles which are put in the compartments 5.

20 Neither in the cross sides 3 there is not a single column 25 or any other vertical reinforcement construction in between the two corner columns 7. The window 8 in this side 3 runs uninterruptedly over the middlemost compartment 5 and a part of the two outmost compartments 25 along this side. Also through the cross sides, the bottles 25 in the compartments 5 are optimally visible.

25 The impairment which is caused because two columns are left out between the compartments 5 along the cross sides 3 and because one column is left out in the middle along the longitudinal side 2, is compensated by the presence of four hollow, round columns 25 inside the crate. These four columns 25 are situated diagonally towards the four corner columns 7 on the intersection of parts of the lattice work 5 which confine among others the compartment 5 in the corner, being where four neighbouring compartments 5 meet.

30 The four columns 25 extend from the bottom 1 to the top of the crate and contract somewhat towards the top 40 so as to make it possible to take them out of the mould. Parts of the lattice work 4 connected to these columns 25, as is clearly shown in figure 2, have a sloping, contracting part which runs almost to the top and reinforces the columns.

45 The hollow columns 7, 18 and 25 are open at their bottom end, but closed at their top end except for a round opening 26.

50 By leaving out certain columns in the sides 2 and 3, and by adding columns 25 inside, the crate offers a good visibility of the bottles through large windows and a very good strength in the upward direction, such that column stacking as well as cross stacking is possible.

55 The present invention is in no way limited to the embodiment described above; on the contrary, many modifications can be made to this embodiment, among others as far as form, composition, arrangement and the number of parts used for the realization of the invention are concerned, while still remaining within the scope of the invention.

In particular, the reinforcement constructions do not necessarily have to be hollow columns. Especially in the corners and in the sides, these constructions may consist of ribs.

These reinforcement constructions must not necessarily extend to exactly the top of the crate. They may end somewhat under this top provided the edges standing on the bottom and which penetrate in the crate beneath during stacking are situated such that a crate which is placed on top does not rest on the reinforcement constructions of the crate beneath it with its bottom but with these edges.

The crate must not necessarily have twelve compartments. It may for example also contain 24 compartments.

#### Claims

1. Stackable crate made of plastic, containing an almost rectangular bottom (1), two longitudinal sides (2), two cross sides (3) and a lattice work (4) which divides the crate in compartments (5) for bottles, whereby this crate is provided with reinforcement constructions (7, 18) standing on the bottom (1) and reaching almost to the top and with at least one window (15, 16, 17 and/or 8) in at least two sides (2 and/or 3), whereby these sides (2 and/or 3) are free of reinforcement constructions at the height of at least one connection with the lattice work (4) so that a window (8 and/or 16) runs uninterruptedly over two compartments (5) in these sides (3 and/or 2) characterized in that the crate is provided with a reinforcement construction (7) in each of the four corners, and in that it also has reinforcement constructions (25) on the inside standing on the bottom (1) where four neighbouring compartments (5) converge and reaching almost to the top.
2. Stackable crate according to the above claim, characterized in that the reinforcement constructions on the inside contain columns (25).
3. Stackable crate according to any of the above claims, characterized in that the reinforcement constructions in the four corners contain columns (7).
4. Stackable crate according to any of the above claims, characterized in that the cross sides (3) between the reinforcement constructions (7) in the corners are entirely free of reinforcement constructions, but in that it contains reinforcement constructions (25) on the inside of the compartments (5) situated along these sides (3).
5. Stackable crate according to the above claim, characterized in that it contains three compartments (5) along the cross sides (3) and in that it has a reinforcement construction (25) in the two innermost

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corners of the middlemost of these compartments (5).

6. Stackable crate according to any of the above claims, characterized in that it contains two reinforcement constructions (18) along the longitudinal sides (2), in between the reinforcement constructions (7) in the corners, namely one at a distance from each cross side (3) equal to the width of this cross side (3).
7. Stackable crate according to the above claim, characterized in that it is free of reinforcement constructions in between the two reinforcement constructions (18) in the longitudinal sides (2).
8. Stackable crate according to the above claim, characterized in that it contains four compartments (5) along the longitudinal sides (2) and in that a reinforcement construction (7, 18) is provided in the corners in said longitudinal sides (2) and on the side of the compartments (5) touching the corners which is removed from the corners, whereas the longitudinal sides (2) in between the two middlemost compartments (5) are free of reinforcement constructions.

#### Patentansprüche

1. Stapelbarer, aus Kunststoff hergestellter Kasten, umfassend einen nahezu rechteckigen Boden (1), zwei Längsseiten (2), zwei Schmalseiten (3) und ein Gitterwerk (4), das den Kasten in Fächer (5) für Flaschen aufteilt, wobei dieser Kasten mit Verstärkungskonstruktionen (7, 18), die auf dem Boden (1) stehen und nahezu bis zur Oberseite reichen, und mit zumindest einem Fenster (15, 16, 17 und/oder 8) in zumindest zwei Seiten (2 und/oder 3) versehen ist, wobei diese Seiten (2 und/oder 3) an der Stelle von zumindest einer Verbindung mit dem Gitterwerk (4) frei von Verstärkungskonstruktionen sind, so daß ein Fenster (8 und/oder 16) ununterbrochen über zwei Fächer (5) in diesen Seiten (3 und/oder 2) verläuft, dadurch gekennzeichnet, daß der Kasten mit einer Verstärkungskonstruktion (7) in jeder der vier Ecken versehen ist und daß er auch Verstärkungskonstruktionen (25) im Inneren aufweist, die auf dem Boden (1) stehen, wo vier benachbarte Fächer (5) zusammenkommen, und die nahezu bis zur Oberseite reichen.
2. Stapelbarer Kasten gemäß dem vorgenannten Anspruch, dadurch gekennzeichnet, daß die Verstärkungskonstruktionen im Inneren Säulen (25) umfassen.
3. Stapelbarer Kasten gemäß einem der vorgenannten Ansprüche, dadurch gekennzeichnet, daß die Verstärkungskonstruktionen in den vier Ecken Säulen (7) umfassen.

4. Stapelbarer Kasten gemäß einem der vorgenannten Ansprüche, dadurch gekennzeichnet, daß die Schmalseiten (3) zwischen den Verstärkungskonstruktionen (7) in den Ecken völlig frei von Verstärkungskonstruktionen sind, daß er jedoch Verstärkungskonstruktionen (25) im Inneren der entlang dieser Seiten (3) befindlichen Fächer (5) umfaßt.

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5. Stapelbarer Kasten gemäß dem vorgenannten Anspruch, dadurch gekennzeichnet, daß er drei Fächer (5) entlang den Schmalseiten (3) umfaßt und dadurch, daß er eine Verstärkungskonstruktion (25) in den beiden inneren Ecken des mittleren dieser Fächer (5) umfaßt.

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6. Stapelbarer Kasten gemäß einem der vorgenannten Ansprüche, dadurch gekennzeichnet, daß er zwei Verstärkungskonstruktionen (18) entlang den Längsseiten (2), zwischen den Verstärkungskonstruktionen (7) in den Ecken, umfaßt, nämlich eine in einem Abstand zu jeder Schmalseite (3), der gleich der Breite dieser Schmalseite (3) ist.

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7. Stapelbarer Kasten gemäß dem vorgenannten Anspruch, dadurch gekennzeichnet, daß er zwischen den beiden Verstärkungskonstruktionen (18) in den Längsseiten (2) frei von Verstärkungskonstruktionen ist.

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8. Stapelbarer Kasten gemäß dem vorgenannten Anspruch, dadurch gekennzeichnet, daß er vier Fächer (5) entlang den Längsseiten (2) umfaßt und dadurch, daß eine Verstärkungskonstruktion (7, 18) in den Ecken in besagten Längsseiten (2) und an der Seite der die Ecken berührenden Fächer (5) vorgesehen ist, die von den Ecken entfernt ist, während die Längsseiten (2) zwischen den beiden mittleren Fächern (5) frei von Verstärkungskonstruktionen sind.

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coins et en ce qu'il possède également des constructions de renforcement (25) sur le côté interne, qui sont dressées sur le fond (1) à l'endroit où convergent quatre compartiments voisins (5) et qui atteignent pratiquement le sommet.

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2. Casier empilable selon la revendication ci-dessus, caractérisé en ce que les constructions de renforcement sur le côté interne contiennent des colonnes (25).

3. Casier empilable selon l'une quelconque des revendications ci-dessus, caractérisé en ce que les constructions de renforcement dans les quatre coins contiennent des colonnes (7).

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4. Casier empilable selon l'une quelconque des revendications ci-dessus, caractérisé en ce que les côtés transversaux (3) entre les constructions de renforcement (7) dans les coins sont complètement exempts de constructions de renforcement, mais en ce qu'il contient des constructions de renforcement (25) sur le côté interne des compartiments (5) situés le long de ces côtés (3).

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5. Casier empilable selon la revendication ci-dessus, caractérisé en ce qu'il contient trois compartiments (5) le long des côtés transversaux (3) et en ce qu'il possède une construction de renforcement (25) dans les deux coins les plus à l'intérieur du compartiment le plus au milieu parmi ces compartiments (5).

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6. Casier empilable selon l'une quelconque des revendications ci-dessus, caractérisé en ce qu'il contient deux constructions de renforcement (18) le long des côtés longitudinaux (2) entre les constructions de renforcement (7) disposées dans les coins, notamment une à une distance de chaque côté transversal (3) égale à la largeur de ce côté transversal (3).

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7. Casier empilable selon la revendication ci-dessus, caractérisé en ce qu'il est exempt de constructions de renforcement entre les deux constructions de renforcement (18) disposées sur les côtés longitudinaux (2).

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8. Casier empilable selon la revendication ci-dessus, caractérisé en ce qu'il contient quatre compartiments (5) le long des côtés longitudinaux (2) et en ce qu'on prévoit une construction de renforcement (7, 18) dans les coins, dans lesdits côtés longitudinaux (2) et sur le côté des compartiments (5) touchant les coins, qui est éloigné des coins, tandis que les côtés longitudinaux (2) entre les deux compartiments (5) les plus au milieu sont exempts de constructions de renforcement.

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